

Objective criteria needed to determine when baseball players can start throwing programs after shoulder, elbow surgery

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One out of four baseball players who had shoulder or elbow surgery did not pass an objective return-to-throw evaluation at the time of presumed

clearance, based on the time from surgical procedure and objective in-office evaluation by the treating surgeon, according to research presented today at the American Orthopaedic Society of Sports Medicine 2022 Annual Meeting.

The timing for initiation of a throwing program following [shoulder](#) or elbow [surgery](#) in an overhead throwing athlete is dependent on a variety of factors, including a surgical procedure performed, time from surgery, level of competition, and successful progression through a physical therapy program.

"Determining when it is safe for an athlete to begin a post-surgical throwing program is vitally important to ensure a safe return to play, and objective data is often preferred to help accurately make such decisions," said James B. Carr, II, MD, Hospital for Special Surgery, New York City. "However, there is a paucity of objective data available to help guide the decision for the timing of initiation of a throwing program following shoulder and elbow surgery in overhead throwing athletes."

Additionally, it is unknown what percentage of athletes typically achieve appropriate objective criteria at the presumed timepoint for initiation of a throwing program.

To help address this information gap, Dr. Carr and research colleagues developed a study with three goals:

1. To create a reproducible, objective return to throwing protocol.
2. To determine what percentage of post-surgical competitive [baseball players](#) successfully satisfied the objective return to throwing criteria at the presumed time of throwing program initiation.
3. To determine what risk factors were most common in athletes

who failed to meet objective criteria for return to throwing.

Patients who were competitive overhead throwing athletes and who underwent shoulder or elbow surgery by one of the two senior authors were allowed to perform an objective return-to-throwing evaluation at the presumed time of clearance by the treating physician. Each evaluation was performed by a single physical therapist with extensive experience in the rehabilitation of overhead athletes. Patients who accomplished all criteria at the time of evaluation were given a passing grade. Patients who failed the initial objective evaluation were re-tested two weeks later. The surgical procedure, level of play, and reason for failing were recorded for all players.

Dr. Carr and his research team evaluated 48 players, and the level of play was divided into high school (20 patients), college (19 patients), and professional (8 patients). A total of 36 players (75%) obtained a passing grade at the initial evaluation while 12 players received a failing grade (25%). The distribution of passing grades based on surgery type was the following: arthroscopic shoulder surgery: 4/7 patients; UCL reconstruction: 23/31 patients; UCL repair: 3/3 patients; and other elbow surgery (i.e., ulnar nerve decompression transposition, isolated elbow arthroscopy): 5/6 patients.

All players who failed were retested at two weeks and received a passing grade after focused physical therapy to address any insufficiencies.

"Players who received a failing grade demonstrated significantly more elbow extension, less dominant arm maximum shoulder internal rotation strength, and less dominant arm maximum shoulder external rotation strength," Dr. Carr reported.

The most important finding of the current study is that 25% of competitive baseball players did not pass an objective return to throw

evaluation at the time of presumed clearance based on the time from surgical procedure and objective in-office evaluation by the treating surgeon. All patients who failed were able to achieve a passing grade two weeks later after directed [physical therapy](#) to address all insufficiencies. No specific factor reached statistical significance for increasing the odds ratio or relative risk for receiving a failing grade, though undergoing UCL reconstruction demonstrated an insignificant trend for having a lower risk of failing.

"Our findings demonstrate that not all competitive baseball players will be objectively ready to throw at the presumed time point following shoulder and elbow surgery, and insufficient shoulder strength and/or endurance was the most common reason for failure," Dr. Carr said. "It's important to create objective criteria to help determine when to start a post-surgical throwing program is a critical step to ensure safe rehabilitation after shoulder and [elbow](#) surgery in competitive baseball players."

Provided by American Orthopaedic Society for Sports Medicine

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